



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/555,295	05/26/2000	ERICH GOTTWALD	P00.0760	3797
29177	7590	09/17/2004		
BELL, BOYD & LLOYD, LLC P. O. BOX 1135 CHICAGO, IL 60690-1135			EXAMINER LI, SHI K	
			ART UNIT 2633	PAPER NUMBER

DATE MAILED: 09/17/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/555,295

Applicant(s)

GOTTWALD, ERICH

Examiner

Shi K. Li

Art Unit

2633

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 21 June 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 24,26,29-36,39,41,43,45 and 47-57 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 29 and 52-57 is/are allowed.
- 6) ☒ Claim(s) 24,26,30-36,39,41,43,45,47-51 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date: _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date: _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

2. Claims 24, 26, 30-36, 39, 41, 43, 45 and 47-51 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. Claim 24 recites in line 12 the limitation "selectively setting at least one of a level and wavelength". The specification does not teach "selectively setting wavelength". Claim 45 recites in line 9 the limitation "selectively adjusting at least one of power level and wavelength". The specification does not teach "selectively adjusting wavelength".

Claim Rejections - 35 USC § 103

3. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.
4. Claims 24, 26, 30-31, 33-36, 39, 41, 43, 45 and 47-50 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamane et al. (U.S. Patent 5,764,404) in view of Inagaki et al. (U.S. Patent 5,745,283).

Yamane et al. discusses WDM optical amplifier and summaries the functions and operations of the invention in col. 9, line 40-col. 10, line 67. In particular, Yamane et al. teaches

Art Unit: 2633

in FIG. 15 a method for adjusting tilting of WDM signal. FIG. 15 comprises optical fiber 1, WDM filter 29 and photo-sensors 30 for measuring the signal level, and pump signal 2. The pump signal is controlled by a control circuit. When two or more signal levels change, the control circuit adjusts the pump signal power accordingly. If the input power levels do not change, the feedback mechanism keeps the power level at the output of optical coupler 7 constant. Yamane et al. then teaches in col. 10, lines 42-54, FIG. 18 and FIG. 19 the use of two pump signals (pump signal and further pump signal) of different wavelengths to adjust the tilting. One of ordinary skill in the art would have been motivated to combine the various teaching of FIG. 18 and FIG. 19 with the optical amplifier of FIG. 15 because a pump signal and a further pump signal of different wavelengths give different characteristics to the amplifier, as described in col. 10, lines 43-60 of Yamane et al., therefore give better control to the tilting. Thus it would have been obvious to one of ordinary skill in the art at the time the invention was made to use a pump signal and a further pump signal, as taught by FIG. 18 and FIG. 19 of Yamane et al., in the optical amplifier of FIG. 15 of Yamane et al. because two pump signals of different wavelengths give better control of the tilting.

Yamane et al. teaches in FIG. 19 to use a pump signal of 0.98 μm for transmission of 1.53 μm and 1.55 μm signal bands. The difference between Yamane et al. and the claimed invention is that Yamane et al. does not teach to use a pump signal with a wavelength that is greater than a maximum wavelength of each of the transmission bands. Inagaki et al. teaches in col.4, lines 15-42 that a pump signal of wavelength 1.57 μm is preferable over a pump signal of wavelength 1.48 μm . One of ordinary skill in the art would have been motivated to combine the teaching of Inagaki et al. with the modified optical amplifier of Yamane et al. because the

Art Unit: 2633

wavelength 1.57 μm is within the amplification range of EDFA and gives wider control range.

Thus it would have been obvious to one of ordinary skill in the art at the time the invention was made to replace the 1.48 μm pump signal with a 1.57 μm pump signal, as taught by Inagaki et al, in the modified optical amplifier of Yamane et al. because the wavelength 1.57 μm is within the amplification range of EDFA and gives wider control range.

Regarding claim 45, Inagaki et al. teaches in col. 4, lines 45-53 to control the power of the light source 40 and light source 14.

Regarding claims 26, 30, 47 and 49-50, Yamane et al. discloses in col. 9, line 40-48 that the invention controls the total level of the optical output of the amplifier according to the number of optical signals of different wavelength. Accordingly, a receiver always receives each of the optical signals at a required level even if one of the optical signals is absent.

Regarding claim 31, Inagaki et al. teaches in col. 3, lines 41-45 to select the power level of the pump signals to obtain a desirable output tilting.

Regarding claim 33, Yamane et al. teaches in col. 10, lines 55-60 to equalize the different wavelength bands.

Regarding claims 34-35 and 48, Yamane et al. teaches in col. 9, lines 53-54 to control the pump power levels to keep the optical signal constant.

Regarding claims 36, 39, 41 and 43, Yamane et al. teaches in FIG. 19 the injection of one pump signal at a receiving end and one pump signal at a transmission end of the optical conductor 1.

Art Unit: 2633

5. Claim 32 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yamane et al. and Inagaki et al. as applied to claims 24 above, and further in view of Onaka et al. (U.S. Patent 6,067,187).

Yamane et al. and Inagaki et al. have been discussed above in regard to claims 24, 26, 30-31, 33-36, 39, 41, 43, 45 and 47-50. The difference between Yamane et al. and Inagaki et al. and the claimed invention is that Yamane et al. and Inagaki et al. do not adjust tilting at the receiving end of the optical conductor 1. Onaka et al. teaches in FIG. 13 an amplifier with flat tilting. Onaka et al. monitors and pumps at the receiving end of the optical conductor. One of ordinary skill in the art would have been motivated to combine the teaching of Onaka et al. with the modified optical amplifier of Yamane et al. and Inagaki et al. by monitoring and pumping at the receiving end to minimize tilting at the receiving end because tilting limits the amplification of the amplifier. With tilting, the high power wavelengths may cause saturation while the low power wavelengths do not receiving enough amplification. Thus it would have been obvious to one of ordinary skill in the art at the time the invention was made to monitor and control the tilting at the receiving end of the optical conductor, as taught by Onaka et al., in the modified optical amplifier of Yamane et al. and Inagaki et al. because a minimal tilting allows the maximum amplification from the amplifier.

6. Claim 51 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yamane et al. and Inagaki et al. as applied to claims 24 above, and further in view of Chikuma et al. (U.S. Patent 6,055,093).

Yamane et al. and Inagaki et al. have been discussed above in regard to claims 24, 26, 30-31, 33-36, 39, 41, 43, 45 and 47-50. The difference between Yamane et al. and Inagaki et al. and

Art Unit: 2633

the claimed invention is that Yamane et al. and Inagaki et al. do not include an amplifier at a transmitting portion. Chikuma et al. teaches in FIG. 3 an optical amplification apparatus with an amplifier at the receiving portion of the optical conductor and an amplifier at the transmitting portion of the optical conductor. One of ordinary skill in the art would have been motivated to combine the teaching of Chikuma et al. with the modified optical amplifier of Yamane et al. and Inagaki et al. because additional amplifiers further boost the signal level and allow the signal to be transmitted over a long distance. Thus it would have been obvious to one of ordinary skill in the art at the time the invention was made to include a transmitting portion with an amplifier to further boost the signal level, as taught by Chikuma et al., in the modified optical amplifier of Yamane et al. and Inagaki et al. because a high signal level allows the signal to be transmitted over a long distance.

Allowable Subject Matter

7. Claims 29 and 52-57 are allowed.

Response to Arguments

8. Applicant's arguments filed on 15 October 2003 have been fully considered but they are not persuasive.

Regarding the 35 U.S.C. §112 rejection, Applicant argues that the specification contains disclosures describing how wavelengths are selectively set or adjusted. The Examiner disagrees. The word "set" or "adjust" as used in the claim implies that the wavelength of a pump laser can be varied. While the specification teaches adjusting power level of a pump laser (e.g., page 11, lines 9-10 recites "readjusts the power of the pump oscillator), the specification only teaches choosing wavelengths for pump lasers (e.g., page 6, lines 14-16 recites "to use a plurality of

Art Unit: 2633

pump lasers having different wavelengths below or above the transmission bands"). Once a laser is chosen, its wavelength is fixed (e.g., page 10, line 5 recites "a pump signal PS of constant wavelength λ_{L1} "). Nowhere does the specification teach to use a laser with tunable or adjustable wavelength. Therefore, the 35 U.S.C. §112 rejection is proper.

Regarding the 35 U.S.C. §103 rejection, Applicant argues that Yamane et al. does not teach the feature "at least one further pump signal having a wavelength that is greater than a maximum wavelength of each of plurality of transmission bands" recited in claim 24, and the other cited prior art does not cure the deficiencies of Yamane et al. The Examiner disagrees. Inagaki et al. teaches in col.4, lines 15-42 that a pump signal of wavelength 1.57 μm is preferable over a pump signal of wavelength 1.48 μm . One of ordinary skill in the art would have been motivated to combine the teaching of Inagaki et al. with the modified optical amplifier of Yamane et al. because the wavelength 1.57 μm is within the amplification range of EDFA and gives wider control range. Thus it would have been obvious to one of ordinary skill in the art at the time the invention was made to replace the 1.48 μm pump signal with a 1.57 μm pump signal, as taught by Inagaki et al, in the modified optical amplifier of Yamane et al. because the wavelength 1.57 μm is within the amplification range of EDFA and gives wider control range. That is, Yamane et al. and Inagaki et al. together teach all the limitations of claim 24, and claim 24 is unpatentable under 35 U.S.C. 103(a).

Conclusion

9. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Shi K. Li whose telephone number is 571 272-3031. The examiner can normally be reached on Monday-Friday (8:30 a.m. - 5:00 p.m.).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jason Chan can be reached on 571 272-3022. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

skl



JASON CHAN
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600